## Art. XXI.—*Description of Vacuum Apparatus.*

By H. Sutton.

(With Diagram.)

[Read 13th December, 1881.]

This apparatus is the outcome of several forms of vacuum apparatus I have devised for the rapid production of high vacuum suitable for electric lighting by the incandescent system, or investigations such as Mr. Crookes has recently given to science.

A mercury bottle (m) when held up, allows mercury to rise in tube (A), filling reservoir (B), and rising in branch pipe (C) isolates lamp globe (H) from reservoir (B). The mercury passes by outlet pipe (D), filling vessel (G) till it overflows by pipe (E) into vessel (F); (G) is a glass tube of large diameter, having a glass stopper in each end, both stoppers being covered by a mercury jacket; the lower half of this tube is filled with broken pumice, soaked in sulphuric acid to absorb any moisture, the upper half being filled with pumice, gilded with gold leaf to absorb traces of mercury vapour. On lowering mercury bottle, the mercury descends in reservoir (B) and pipe (C), leaving a Torcillian vacuum in (B), the mercury in (D) being supported by atmospheric pressure. On lowering (m) sufficiently, communication is established between reservoir (B) and vessel to be exhausted (H) by means of branch pipe (C) and dissecting apparatus (G), the air in (H) then expanding over into (B); the mercury bottle (m) is then raised again, and the mercury rising in (B) drives out the expanded air by outlet pipe (D). This pipe is bent back on itself at the lower end; this is to prevent the ingress of any air that might collect on end of pipe in vessel (I), alternate raising and lowering the mercury bottle (m) producing a vacuum.